Merit, Red Rock, and Potomac—Tomato Varieties Adapted to Mechanical Harvesting

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Merit, Red Rock, and Potomac—
Varieties Adapted to Mechanical Harvesting

By Allan K. Stoner, *Plant Science Research Division, Agricultural Research Service*[1]

nately 15 percent of the creage in the Eastern and was harvested mechanically. th California where nearly he acreage is machine har- reasons for the slow conver- on in the East is the lack of be handled mechanically and to the eastern and midwestern ditions.

of the 1971 growing season, three ties—Merit, Red Rock, and Poto- released to seedsmen from the program at Beltsville, Md. Numerous ring 1970 and 1971 demonstrated that varieties are adapted to some tomato- areas of the Eastern United States sess the characteristics necessary for achine harvesting.

Pedigree

an F_5 generation selection with nu- nes and varieties of diverse origin in erage. Its pedigree is shown in figure 1. nal cross from which Merit was derived 1966. The cross involved an early- lific flowering line with jointless od break and crack resistance and elongated fruits and excellent echanical breaking. Merit was als as breeding lines with the 52[illegible] and 69B46.

omato lines ebb of this Division. V. B. Stalter, American p., R. W. Hepler, Pennsylvania State B. Johnson, Rutgers University, and niversity of Maryland, for their assist- ng the new varieties.

Red Rock was evaluated as lines 70B831 and 69B281. It is an F_6 generation selection from a cross made in 1968 between a selection from

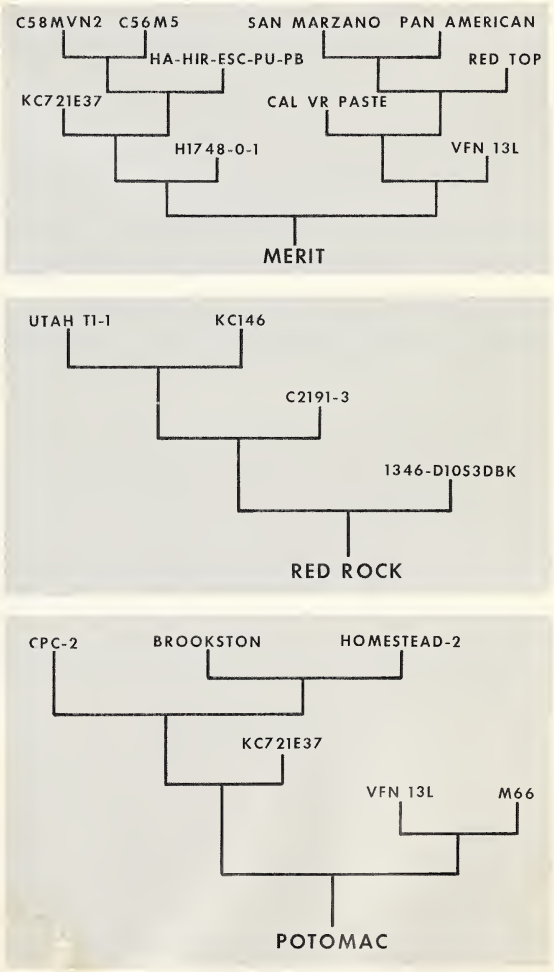

FIGURE 1.—Parentage of Merit, Red Rock, and Potomac tomato varieties.

a line developed by the Florida Agricultural Experiment Station and a line developed at Beltsville. The Beltsville selection from FLA 1346–D10S3DBK was jointless and had very firm fruits. The Beltsville-bred line used in the cross from which Red Rock was derived was a medium early line with excellent crack resistance. The pedigree of Red Rock is shown in figure 1.

Potomac is an F_6 generation selection that was tested under the numbers 70B843 and 69B781. Its pedigree is shown in figure 1. The final cross to obtain Potomac was between a very prolific F_6 selection with excellent processing quality and an F_1 plant with elongated fruit and excellent firmness and break resistance. This cross was made in 1966.

Description

Merit produces a small to medium-sized determinate vine that sets a large number of fruits in a short time. Since this variety possesses a jointless pedicel, the fruits are shaken off the vine with no stems remaining attached to them. The fruits are globe shaped as shown in figure 2. They weigh from 2.5 to 4 ounces, averaging about 3 ounces or slightly less. They are a uniform green when immature and a deep red when mature.

Merit is comparable in maturity to the C28 and Mars varieties. It has yielded well in replicated trials in several locations and in growers' fields (tables 1 and 2). Once-over harvests of Merit in growers' fields have yielded between 18 and 21 tons of usable fruits per acre depending on growing and harvesting conditions. Red ripe fruits store well for several days on the vine. They separate easily from the vine during machine harvesting but do not shatter.

Red Rock produces a medium-sized determinate vine that yields its maximum number of ripe fruits for a once-over harvest about 7 to 10 days later than C28 and Mars. Yields in growers' fields have ranged from 12 to 25 tons of usable fruits per acre (table 2). Observational plots and replicated yield tests have consistently indicated that this variety has the potential to yield over 25 tons per acre under good growing conditions (table 1).

The fertility practices used in growing Red Rock can be important. The variety tends to

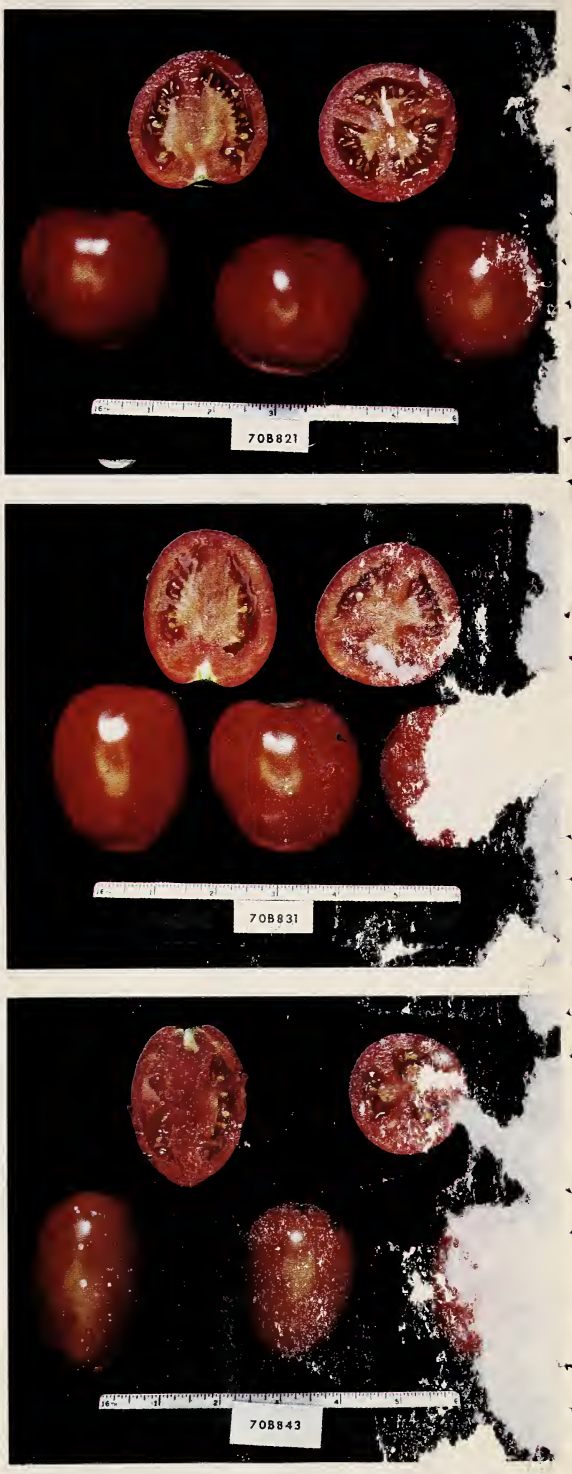

FIGURE 2.—Fruits of Merit, Red [illegible] tomato varieties

TABLE 1.—*Once-over harvest yields per acre of usable fruits from 3 tomato varieties and 2 checks at 4 locations*

Variety	Beltsville, Md.		Salisbury, Md., 1971	Centerton, N.J., 1971 [1]	Rock Springs, Pa.	
	1970	1971			1970	1971
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
Merit	36.5	23.5	21.3	31.7	26.3	17.2
Red Rock	37.0	43.5	20.6	37.1	36.8	26.7
Potomac	38.5	30.2	21.8	34.9	19.0	19.8
C-28	29.2	27.1	22.4	27.6	29.2	26.0
Chico III	----	21.2	26.0	39.1	23.3	26.6

[1] Mean of 8 direct-seeded and 8 transplanted replications.

ABLE 2.—*Once-over harvest yields per acre of usable fruits from 3 tomato varieties in growers' fields*

ar and variety	Size of planting	Yield
1970	*Acres*	*Tons*
rit	1.69	18.3
	.51	19.6
	.17	25.3
Rock	.37	11.8
	.48	21.2
	.75	19.6
	.50	18.0
971		
	11.16	21
	2.80	21
oma	2.98	28

uce a large vine and poor concentration of t if excessive nitrogen fertilizer is used.

Fruits of Red Rock are globe to deep globe shape as shown in figure 2 and weigh from 2.5 to 4 ounces. The average fruit is slightly ger than that of Merit and the external and erna walls are thicker. Like Merit, Red Rock ointless pedicel. The immature fruits of Rock are a uniform green. The mature its are an intense red, which is comparable varieties with the crimson gene.

utstanding traits of Red Rock are the rmness of the ripe fruits and their to store very well on the vine. These teristics allow for good concentration of uits.

Potomac variety has a medium-sized de- te vine that sets a large number of short time. Its maturity has ranged 8 to about 10 days later depend- where it was grown. In replicated tests Potomac has yielded over 30 tons per acre on several occasions (table 1). In once-over harvests of commercial plantings it has yielded from 18 to 28 tons of usable fruits per acre (table 2).

The fruits of Potomac are oval to slightly elongated, ranging up to 3.5 inches in length and 2 inches in diameter (fig. 2). Individual fruits weigh from 2.5 to 3.5 ounces. Immature fruits are a uniform green. Since the Potomac variety does not have the jointless pedicel, 25- to 50-percent stem retention on the fruits can be expected during harvest.

The foliage of Potomac plants tends to be a light yellow green. This may create the impression that the plants are nitrogen deficient when they are not.

All three varieties have performed well whether direct seeded or transplanted. Maximum yields have been obtained when they were grown at an in-row spacing of about 12 inches. When direct seeded, a spacing of 9 to 12 inches between clumps has produced good results. All three varieties have been harvested satisfactorily with several different brands of tomato harvesters.

Disease Resistance

Merit, Red Rock, and Potomac are all highly resistant to race 1 of fusarium wilt and to verticillium wilt. Red Rock and Potomac are also resistant to gray leaf spot caused by *Stemphylium solani* Weber.

Merit and Potomac possess good levels of crack and burst resistance, but Red Rock is outstanding for these traits. During the 1971 growing season the tomato-producing areas in the mid-Atlantic States received very heavy

rains during September, causing a significant amount of fruit cracking and bursting in standard crack-resistant varieties. But wherever Red Rock was planted it withstood the rains with practically no cracking or bursting. Merit and Potomac did show some ripe fruit bursting during the heavy rains but no more than commercially grown varieties.

Processing Quality

Laboratory tests have shown that the fruit-processing qualities of Merit, Red Rock, and Potomac compare favorably with those of varieties grown in the East. Soluble-solids values for the new varieties have ranged from 4.8 to 6.4 percent and pH values from 4.20 to 4.35. Color of the varieties, as measured by a Gardner Color Difference Meter, ranged from an a/b reading of 2.231 to 2.553. Table 3 contains data taken in Beltsville, Md., and Milton, Pa., on the quality of the three varieties and the two checks.

The Merit variety may be particularly suited for whole processed tomatoes in addition to being satisfactory for use in tomato products. Since it has rather small stem s
nal cores, it may be canned
being cored. Samples of Merit
whole following commercial prac
pared very favorably with pre
products. Red Rock fruits
small core, but the stem sc
to be acceptable for whole

Adaptati

In addition to the trial locat
table 1, the three varieties have
numerous other places in variou
country. With certain possible
new varieties appear to be best
mid-Atlantic States, which inclu
producing areas of Pennsylvani
Maryland, and Virginia.

Seed Productio

Seeds of Merit, Red Rock, and
been made available to the m
seed-producing companies in the
Requests for seed should be dir
companies.

TABLE 3.—*Laboratory quality data on raw juice of 3 tomato varieties and 2 checks*

Location and variety	Soluble solids	pH	a/b Color[1]	Consister
Beltsville, Md., 1971:	*Percent*			
Merit	5.3	4.35	2.303	
Red Rock	5.1	4.20	2.320	
Potomac	4.8	4.35	2.239	
C28	5.4	4.20	2.368	
Chico III	5.2	4.35	2.312	
Milton, Pa., 1971:				
Merit	5.0	4.24	2.553	
Red Rock	5.7	4.23	2.231	
Potomac	5.7	4.25	2.2[illegible]	
C28	4.9	4.30	2	
Milton, Pa., 1970:				
Merit	5.0	4.20	2.322	
Red Rock	5.6	4.20	2.487	
Potomac	6.4	4.20	2.506	
C28	5.1	----	----	
Chico III	5.1	----	----	

[1] Measured by a Gardner Color Difference Meter.
[2] Measured by a Bostwick Consistometer.

Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture or an endorsement by the Department over other products not mentioned.

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